

Symons's Meteorological Magazine.

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DAYLIGHT SAVING AND SHAM TIME.

THE easiest way out of a difficulty is not always the best, and the device by which the people of Great Britain are induced to rise and encouraged to go to bed an hour earlier in summer than in winter reminds us of the confused sentiments of the careless Sunday-school boy. That urchin when asked for the Scriptural definition of a lie is reported to have answered glibly, "A lie which is an abomination unto the Lord is a very present help in time of trouble." Of course a lie is not a lie when it is a convention as when a Government official dismisses a worthless subordinate in a letter which states that he is the obedient servant of the delinquent, and no doubt the House of Commons in compelling us to keep the time of the enemy meridian of 15° E. does not really expect us to believe that German time is our time any more than a seller of teaspoons would expect us to believe that German silver is real silver. The Summer Time Act is undoubtedly a very present help in a time of trouble, but we fear that it involves an abominable principle. The same principle would permit economy in railway mileage to be effected by introducing a short Bill to provide that during certain months Willesden Junction shall be called Euston Station, or promote temperance and attendance at public worship by providing that on Sundays St. Paul's shall be called the Red Lion, and on week days the Red Lion shall be called St. Paul's. We are of opinion that long before he grew to man's estate the silly Sunday-school boy found out that the present help of a lie often led to unpleasant consequences that he never anticipated, but the hasty legislators are more fortunate as being able to throw the unpleasant consequences of their convention on others and so naturally ignore them. Parliament has decreed that Sunday, May 21st, shall consist of 23 hours, and that October 1st shall consist of 25 hours, while the phenomena of Nature will continue on the basis of the 24 hour day all through. How does the Government meet this difficulty in the work of the scientific departments supported by the State? The Act itself exempts astronomy and navigation, and the Meteorological Office has sent out the following circular:—

METEOROLOGICAL OFFICE,

4th May, 1916.

In view of the proposal for Daylight Saving by altering the clocks which is to come before Parliament on Monday, May 8th, it is necessary to point out that the observations at all meteorological observatories and stations must continue to be taken at the same time of day according to Greenwich Mean Time as heretofore, irrespective of any alteration of the setting of clock hands.

To avoid confusion in the subsequent use of the records it will be necessary in future whenever an hour is mentioned in the meteorological schedules to specify the time standard followed : viz., Greenwich Mean Time for all telegraphic reporting stations and Local Mean Time for those stations of the second order or other orders which have hitherto observed according to Local Mean Time.

All clocks used by observers for regulating their duties should continue to be set according to Greenwich Mean Time.

The hours of attendance at the office and observatories for all duties connected with observing, and with the service of the Daily Weather Reports for the Naval and Military Services must also continue to be regulated according to Greenwich Mean Time, and will, therefore, be nominally one hour later when the public clocks are put forward by one hour.

As the hour of attendance at the Office in the morning is at present an hour in advance of the commencement of work at public offices generally, the hour of attendance during the months when the clocks are moved forward will be reconsidered and order made accordingly.

NAPIER SHAW,

Director.

This shows that so far as Government meteorological work is concerned the Act is simply ignored. The ordinary voluntary Observer is in a different position. He must in the great majority of cases, go to work by the altered clock time and take his meals by the same sham time. Hence in most cases at 10 a.m., the true 9 a.m., he will be otherwise employed and unable to take his readings. At 10 p.m., the real 9 p.m., many honest gardeners will be in bed. The temperature, humidity, pressure and cloud observations taken by the sham time refer to a different period of the day, 9 a.m. to a cooler, 9 p.m. to a warmer period. As far as possible we hope that all meteorological Observers will endeavour to continue to use the old times. But we cannot ignore the fact that while most of the hundreds of the complete meteorological statistics will probably be kept up in accordance with the Meteorological Office instructions, very many of the thousands of Observers of rainfall must perforce keep to the 9 a.m. clock time for their readings. The hour of the daily observation was fixed at 9 a.m. of the clock because experience showed that for the people of this country, as a whole, rich and poor, occupied or leisured, that time was the most convenient as regards meal-hours and work hours, and by its use the greatest measure of uniformity could be obtained. An association of voluntary Observers such as the British Rainfall Organisation produces its best work in the condition of maximum convenience, and its Director has to bear this in mind. He cannot say that all Observers "must" do this or that unless he is prepared to refuse to accept such observa-

tions as they may find possible. Perfect uniformity cannot be obtained. It does not exist now. The Irish day differs at any given hour by nearly half an hour from the British day. Some Observers can only observe at 8 a.m., others at 10 a.m. Hence we must endeavour to minimise the errors thrust upon us by the hasty legislation of a Parliament which has been ambushed by well-meaning enthusiasts who see only one side of a question, and our advice to rainfall Observers is—**While the clock shows sham time observe, if possible, at 10 a.m. (9 a.m. true time), but if it is not possible to do so observe at 9 a.m. (clock time) and mark the return "From 21st May to 1st October, 9 a.m., S.T."** Recording instruments should be kept running to true time.

SOME METEOROLOGICAL CURIOSITIES.

By HY. HARRIES.

THERMOMETERS always look such staid and inoffensive objects that at first sight it might seem absurd to associate them with any mirth-provoking qualities. On close acquaintance, however, there is no doubt that at times it is possible to discover about them something akin to humour—dry or wet.

Recently, at a well-known establishment in the West End, I was shown a couple of thermometers, mounted on porcelain, as very fine examples of the work produced in one of the best London factories. Noticing that they excited my risible faculties, the salesman broke in with "Oh! they have been specially made for use in Egypt!" "Indeed!" was my reply, "I did not guess that Pharaoh's land possessed such an extraordinary climate." The two instruments were graduated, every degree, from below 20° to above 280° F., or to 70° above the boiling point of water!

They reminded me of a thermometer supplied by the maker to an observer in an inland part of England, subject to severe winter cold, occasionally 20° to 30° below the freezing point. The instrument was produced for my inspection. Its graduation commenced at 30° F., and the observer explained that for greater cold than that he had to guess the reading! At the other extreme the graduation extended far beyond anything possible in our climate, even when the instrument is freely exposed to the sun.

At page 38 of the Meteorological Office publication, the *Marine Observers' Handbook*, it is stated, in connection with sea temperature observations, that "The thermometer is graduated on Fahrenheit scale from 26° to 95°." This is for use in all the seas of the globe, between the Equator and the Poles. However, at one of the most popular of our seaside holiday resorts, the local authorities, anxious to gratify the curiosity of their visitors as to the tempera-

ture of the sea every day, invested in a well-protected thermometer, in a copper case, and the pier master was very proud of it. I found it had a range of 86° Fah., from 2° below zero to 84° above ! In reply to my enquiry if the sea temperature had been down to zero yet : " No, Sir ! " was the reply, " you see, we have not had the old-fashioned cold winters for many, many years ! "

At another much-frequented bathing place on the same coast the authorities were faced by the same demand for a knowledge of the water temperature, and, perforce, a thermometer had to be obtained. To insure that everything was quite correct it was decided to obtain the instrument direct from the makers. When I saw it, many months or a year afterwards, it had not been made any use of, for the simple reason that the person in charge had no idea how it was to be manipulated, and the makers had supplied no instructions. It was an elaborate and ponderous contrivance, suitable for obtaining the temperature at a depth of miles instead of at a few inches !

Newspaper meteorology frequently is a fearful and wonderful thing, and this is not surprising when it is known that the great majority of the writers have not the most elementary knowledge of the subject, so that absurdities abound in their contributions. A year or two ago I was hailed by a young gentleman who was hard at work at a pile of statistics. Could I afford him any enlightenment in his difficulties. " Yes, what is their nature ? " " Well, you see, my Editor has asked me to contribute a column article on the wet weather and the floods, and I am copying all the rainfall records from these sheets, but I confess I do not quite understand how to use them now I have got them." He had copied some yards of figures. " Unfortunately, you have wasted the whole of your time," I said ; " these are not rainfall statistics ! " " Not rainfall," he replied, " What are they then ? The sheets are all headed *Wet Bulb* ! "

The mention of rainfall brings to mind a dispute between colonial gentlemen as to the merits or demerits of their rain gauges. One of them insisted that he invariably registered much larger falls than his neighbours, and he knew he was correct because he was always particularly careful in measuring the contents of his gauge. I was appealed to for an explanation. It turned out that when on a visit to London he took a fancy to a rain gauge which he saw in the window of a second-hand shop, and forthwith purchased it for a trifle. Whether it was a 5 in. or an 8 in. gauge he did not know, but there was no graduated measuring glass, and he was not aware that one was necessary. When he found there was water in the gauge he emptied it into any convenient vessel—a tumbler, a jug, or anything else—dipped a foot rule into the water to ascertain its depth, and that gave him the rainfall in inches and points !

METEOROLOGICAL OBSERVATIONS AT LU-KIA-PANG.

By REV. J. DE MOIDREY, S.J.

(Continued from p. 36.)

1915.

I.—Barometric Pressure. Millibars.					IV.	V.
	8 a.m.	2 p.m.	8 p.m.	Daily Mean	Mean amount of Cloud at 8 a.m., 2 p.m. & 8 p.m.	Days with Thunderstorms.
Jan.	1027·6	1025·5	1026·9	1027·32	Jan. 6·1	Jan. 0
Feb.	1022·3	1020·5	1021·5	1022·0	Feb. 7·6	Feb. 3
Mar.	1022·3	1020·5	1021·6	1021·5	Mar. 6·2	Mar. 1
April	1016·6	1015·4	1016·1	1015·5	April 8·6	April 2
May	1010·6	1009·2	1009·7	1009·0	May 6·2	May 2
June	1006·6	1005·6	1006·0	1005·3	June 8·0	June 1
July	1004·6	1003·0	1003·6	1002·8	July 5·8	July 4
Aug.	1003·7	1002·4	1003·2	1002·0	Aug. 6·9	Aug. 8
Sept.	1012·7	1011·4	1012·4	1011·1	Sept. 6·6	Sept. 2
Oct.	1017·7	1015·7	1017·1	1016·0	Oct. 6·9	Oct. 0
Nov.	1025·8	1023·9	1025·3	1024·5	Nov. 7·2	Nov. 0
Dec.	1025·4	1023·3	1024·5	1024·3	Dec. 4·9	Dec. 0
Year	1016·3	1014·7	1015·7	1015·1	Year 6·75	Year 23

1915.

II.—Temperature. Degrees Centigrade.

MEAN DAILY.				MINIMUM.			
	Mean.	Lowest.	Highest.	Mean.	Hour. A.M. hr. min.	Lowest.	Highest.
Jan.	3·6	—6·7 _a	11·5	0·3	4 33	—9·2 _c	8·9
Feb.	4·8	—4·0	14·3	1·9	3 43	—7·4	9·4
Mar.	7·5	2·6	14·3	3·3	4 31	—1·2	7·3
April	12·9	7·7	21·7	9·7	2 53	2·8	15·5
May	19·9	13·1	26·7	14·8	4 28	8·9	19·2
June	24·3	20·7	27·8	21·2	4 33	17·7	25·6
July	27·6	21·3	30·9 _b	24·3	3 29	20·2	27·1 _d
Aug.	26·8	23·5	28·9	23·6	3 43	19·7	26·3
Sept.	22·3	17·5	28·0	19·2	3 35	13·4	25·2
Oct.	19·1	13·6	24·5	15·7	3 31	10·9	20·3
Nov.	12·8	6·5	18·3	10·2	4 23	2·2	16·8
Dec.	7·0	1·7	13·2	2·8	4 43	—3·9	10·6
Year	15·7	—6·7	30·9	12·3	3 35	—9·2	27·1

Latest frost, March 30th; earliest, December 15th.

II.—(con.)

II.—(con.)		MAXIMUM.				RANGE.			
		Mean.	Hour. hr. min.	p.m.	Lowest.	Highest.	Mean.	Lowest.	Highest.
Jan.	....	8·0	1	28	—4·8 _e	16·0	7·6	1·8	15·0
Feb.	....	8·5	1	43	—0·4	20·0	6·6	0·8	13·6
Mar.	....	12·9	1	59	5·3	22·5	9·6	2·0	16·2
April	....	17·0	1	4	11·6	28·2	7·4	1·1	15·5
May	....	26·0	1	56	15·8	35·6	11·1	1·0	17·6 _h
June	....	28·5	2	5	23·0	34·9	7·4	1·6	13·0
July	....	31·7	2	50	22·0	36·4 _f	7·4	1·7	11·0
Aug.	....	31·2	2	29	26·9	34·1	7·6	2·6	13·6
Sept.	....	27·0	1	17	19·2	32·6	7·8	0·7 _g	12·7
Oct.	....	23·9	1	3	16·4	30·5	8·1	1·8	14·5
Nov.	....	16·6	1	6	10·3	23·4	6·4	1·6	11·6
Dec.	....	12·4	2	4	4·3	17·1	9·5	2·8	15·9
Year	....	20·3	1	45	—4·8	36·4	8·0	0·7	17·6

a Jan. 13. b July 12. c Jan. 14. d July 14 e Jan. 13 f July 12. g Sept. 24. h May 30

The highest reading in each column is in heavy type, the lowest in italic.

1915.

III.—Relative Humidity. Per cent.

	RELATIVE HUMIDITY.			VAPOUR TENSION.		
	Mean.	Lowest.	Highest.	Mean.	Lowest.	Highest.
Jan.	75	44	97	4.8	1.2	7.9
Feb.	79	60	96	5.4	2.0	11.5
Mar.	69	54	95	5.6	3.3	8.5
April	80	53	97	9.2	4.7	16.4
May	68	48	97	12.5	7.9	16.6
June	79	63	96	18.2	14.7	23.0
July	78	62	96	22.3	17.0	25.1
Aug.	84	73	94	22.8	18.5	25.7
Sept.	81	61	96	16.9	9.9	22.7
Oct.	84	66	98	14.4	8.1	18.6
Nov.	80	61	98	9.5	5.8	14.2
Dec.	76	55	97	6.0	2.9	9.8
Year	77.8	44.1	98.1	12.3	1.2	25.7

1915.

VI.—Rainfall.

	(a). INTENSITY. Days with								DAYS WITH		
	mm. 0.1—0.9	1—2.9	3—4.9	5—9.9	10—19.9	20—39.9	40—59.9	60.0 & over	Rain.	Snow.	Total.
Jan.	9	2	0	1	1	0	0	0	13	1	14
Feb.	4	0	3	1	4	0	0	0	12	2	14
Mar.	4	0	1	2	3	0	0	0	10	—	10
April	3	0	4	5	2	2	0	0	16	—	16
May	2	0	3	1	0	1	0	0	7	—	7
June	8	3	1	3	3	0	2	1	21	—	21
July	0	0	0	2	1	2	1	0	6	—	6
Aug.	6	4	3	0	3	3	0	0	19	—	19
Sept.	7	3	0	1	3	0	1	0	15	—	15
Oct.	9	1	1	3	1	2	0	1	18	—	18
Nov.	7	2	0	2	2	3	0	0	16	—	16
Dec.	7	0	0	0	0	0	0	0	7	—	7
Year	66	15	16	21	23	13	4	2	160	3	163

VI.

(b). Total Rainfall. Millimetres.

	8 p.m. —8 a.m.	8 a.m. —8 p.m.	Total.
Jan. ..	20.0	6.5	26.5
Feb. ..	46.5	36.8	83.3
Mar. ..	43.3	15.6	58.9
April ..	86.2	43.6	129.8
May ..	11.1	34.3	45.4
June ..	127.3	145.6	272.9
July ..	49.3	78.3	127.6
Aug. ..	28.0	110.3	138.3
Sept. ..	52.5	56.6	109.1
Oct. ..	120.3	54.9	175.2
Nov. ..	75.1	72.7	147.8
Dec. ..	0.3	0.0	0.3
Year ..	660.4	655.2	1315.6

VI.

(c). Rainless Periods of 10 days or more, excluding dew.

Began.	Ended.	Lasted.
Jan. 12	Jan. 25	14 dys.
April 25	May 9	11 "
May 23	June 3	12 "
Sept. 25	Oct. 9	15 "
Nov. 25 ^k	Jan. 6, 1916	43 "

^k In December there were only heavy dews.

1915.

VIII.

VII.—Wind. (a).

Mean Duration of Bright Sunshine.
*Hours.**Mean Velocity at 8 a.m., 2 p.m.*
and 8 p.m. Metres per second.

	Fore-noon.	After-noon.	Total.	Per-centage of possible.	Mean amount of Cloud. ^m		Min.	Max.	Mean.
Jan. ..	2.1	2.3	4.4	43	5.7	Jan. ..	2.4	6.7	4.0
Feb. ..	1.6	2.0	3.6	32	6.8	Feb. ..	1.6	9.2	4.2
Mar. ..	3.0	2.3	5.3	45	5.5	Mar. ..	1.1	9.0	4.3
April ..	0.8	0.9	1.7	13	8.7	April ..	1.6	7.7	3.9
May ..	2.4	2.2	4.6	33	6.7	May ..	1.3	8.2	4.0
June ..	2.3	2.7	5.0	36	6.4	June ..	..	..	[3.8] ^l
July ..	4.5	4.4	8.9	63	3.7	July ..	..	..	[4.9] ^l
Aug. ..	3.1	2.3	5.4	41	5.9	Aug. ..	0.9	8.1	2.9
Sept. ..	2.7	2.8	5.5	45	5.5	Sept. ..	1.1	5.9	3.0
Oct. ..	2.4	1.9	4.3	37	6.3	Oct. ..	1.2	6.4	3.2
Nov. ..	2.0	1.4	3.4	32	6.8	Nov. ..	0.8	7.4	3.5
Dec. ..	2.2	2.5	4.7	46	5.4	Dec. ..	0.8	9.7	3.1
Year ..	2.4	2.3	4.7	39	6.1	Year ..	0.8	9.7	[3.7] ^l

^l The typhoon of June 28th overturned the anemometer and caused the loss of several days' observations in June and July, thus making the mean values defective.

^m The amount of cloud refers to the whole day, excluding the night. Table IV. is limited to the three hours of observation, 8 a.m., 2 p.m. and 8 p.m.

VII. Wind (b.)—Direction. Percentage Frequency.

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	Vari-able.
Jan.	19	16	1	14	5	5	13	24	0	3
Feb.	12	23	8	8	2	2	15	30	0	0
Mar.	19	12	11	16	11	7	5	18	0	1
April	13	23	15	18	10	9	7	4	1	0
May	15	4	5	35	13	13	6	9	0	0
June	4	8	11	33	17	11	4	11	0	1
July	0	2	12	42	19	17	4	2	0	2
Aug.	17	8	12	21	4	7	7	22	0	2
Sept.	21	30	12	5	6	1	5	19	0	1
Oct.	34	27	17	13	3	1	1	4	0	0
Nov.	23	34	11	5	0	0	4	21	0	2
Dec.	11	20	5	15	9	10	5	23	1	1
Year	15.7	17.3	10.0	18.8	8.3	6.9	6.3	15.6	0.2	1.1

ROYAL METEOROLOGICAL SOCIETY.

A MEETING of the Society was held on April 19th, at 10, Victoria Street, S.W., Major H. G. Lyons, F.R.S., President, in the Chair.

Mr. E. V. Newnham, B.Sc., read a paper on "The Persistence of Wet and Dry Weather." The rainfall records of Kew, Aberdeen, and Valencia, for the ten years, 1901-1910, and the twenty-seven years, 1887-1913, at Greenwich, were analysed in order to ascertain to what degree the tendency for wet and fine days or hours to occur in "runs" can be made use of for rain forecasts. It was shown that the chance

of a given day being a "rain day" is increased beyond the normal chance if the preceding day has been wet, and that the probability of rain goes on increasing with continued unsettled weather, and diminishing with protracted drought. On plotting the results from four stations graphically it was seen that they all follow the same general form, in which the probability changes rapidly on passing from wet to fine spells and tends to become constant after long spells. The hourly rain probability was subject to the same laws as the daily probability.

Prof. H. H. Turner suggested the advisability of extending the investigation to include the probability of a day with or without rain to follow a broken run of wet or dry days. Mr. W.W. Bryant pointed out that the curves appeared to be asymptotic, which, since rain could not in any case continue indefinitely was certainly not the case. The persistence of wet or dry spells depended, he thought on the conditions of the atmosphere and not upon the occurrence of previous wet or dry days. Dr. C. Chree considered that the hourly probability was largely dependent on mean diurnal variation, and the daily probability on the seasonal variation of rainfall. The reliability of the curves could best be tested by analysing two successive periods of equal length at the same station and comparing the results.

Prof. H. H. Turner, F.R.S., communicated a second note on "Discontinuities in Meteorological Phenomena," in the course of which he remarked that the Sunderland rainfall, when discussed in "chapters" as suggested in his former paper not only behaved very like the Greenwich rainfall, but showed, as regards mean monthly rainfalls, a close correlation. At Paris, situated an equal distance south of Greenwich, the rainfall has a different character, although the division into "chapters" is still marked. The Paris mean temperatures (*i.e.*, hot and cold periods), from 1801-1915 also respond to the division into "chapters," which are definitely abrupt and not gradual. The variations are apparently periodic but more than one period is involved, the two most marked periods being twenty and twenty-five years, which are also found in tree growth.

Mr. W. Marriott described similar work which he had carried out in connection with the long rainfall records at Greenwich and Rothsay. His results were, on the whole, confirmatory. Mr. Bryant thought that the best test of the truth of the persistence of the periodicities found lay in prediction. Attempts to predict sunspot periods and latitude variations, although resting on a more secure mathematical basis had failed. Mr. Inwards, Mr. J. S. Dines, Dr. Chree, Mr. Jenkin and Mr. Tripp also took part in the discussion. Prof. Turner, in reply, pointed out that he had successfully predicted the past before it was known to him, which he considered an equally good test as predicting the future. The period of $6\frac{1}{2}$ years was the only meteorological period except the twelve-monthly one, which held as long as a hundred years.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

A LONG-LOST BALLOON METEOROGRAPH.

THE following statement may perhaps be of interest. A meteorograph sent up in the usual way from Mungret College, Limerick, on April 12th, 1912, has just been returned. The record is perfectly good and distinct, although it has been presumably exposed to the weather for nearly four years. This is a testimonial to the purity of the air in Ireland. It is very unusual to recover an instrument after the lapse of one year. W. H. DINES.

Benson Observatory, Oxfordshire, 2nd April, 1916.

RAINFALL AND CLOUD-LEVEL.

THE particular piece of positive evidence adduced by Mr. Chisholm in the April number for the cloudless formation of rain is just what I want, but never, indeed, expected to get. My generalization formulated in the March article about the bulk of *cyclonic* rainfall originating below the cloud level depends only upon circumstantial evidence, and I hope to have opportunities while rambling in the hills of observing *how* rain in such circumstances is generated. It has been suggested to me by more than one person that the incompatibility of hill-mist with real rain is the result of the washing out of the mist particles by the larger rain drops, and this would indeed appear to be a factor to be reckoned with—to the extent, in fact, of rendering my inference from the facts less certain. I had overlooked the “washing out” process at the time of writing the article in question, but have reason to think it is not always a very efficient factor.

I fully appreciate Mr. Chisholm's remarks regarding the inadequate explanation given in geographical text books of orographic rainfall. It is, of course, impossible to understand cause and effect in climatology and meteorology without a thorough ground-knowledge of the rudiments of physics, and as many teachers are probably quite ignorant of the principle of adiabatic cooling consequent upon the expansion of air when relieved of a portion of its pressure, they fall into the easy error of assuming that the hills provoke condensation by direct contact chilling—an action which, if it does to some extent occur, must be quite subsidiary and confined to the winter months when the hill sides are colder than the damp Atlantic winds that impinge against them.

L. C. W. BONACINA.

April 27th, 1916.

HEAVY RAINFALL IN IRELAND.

As you like to have prompt information about any abnormal rainfall I may mention that I have gauged 4.35 in. in the last seventy-two hours; 2.34 in. was in the gauge at 9 a.m. on the 6th, and 1.23 in. at the same hour on the 7th. We had wonderful weather up to the 4th and on that afternoon the atmosphere was extraordinarily clear and we saw the Mourne Mountains in Co. Down quite clearly from this, a distance of over fifty miles. At 2 p.m. the glass began to fall. The wind was a trifle N. by E. on Thursday and Friday, but went round to the north on Saturday. THOS. JACKSON.

Farmleigh, Stillorgan, County Dublin, 7th May, 1916.

APRIL WEATHER—A CONTRAST.

25TH April, 1908. Snow 1.05 in., a drift 4 feet deep on the road near by holding up traffic. Minimum temp. 27°—unfortunately I have not the maximum; but it must have been very low.

25th April, 1916. A brilliant hot day, minimum temp. 45°, maximum 75°.

GEO. CHRYSTIE, Colonel.

Short Heath Lodge, Farnham, Surrey.

THE WINTER OF 1915 IN JOHANNESBURG.

By R. T. A. INNES.

THE temperatures in June and August hardly differed from normal, but July was 2° below normal. The winter was, however, exceptional in that in July the precipitation was no less than 2.76 in. on ten days, whereas the average of the eleven previous Julys was 0.15 in. on one day. After thunder-storms, with mist, hail, and rain on the 15th-18th it snowed all day on the 19th. The barometer was never unusually low, but it rose sharply on the 22nd and 23rd, a rise which ushered in our usual bright dry winter weather.

The previous fall of snow occurred in August 1909. The following table shows the mean temperatures and precipitation recorded at the Union Observatory since 1907.

	Mean Shade Temperatures.			Rainfall, Inches and Days.		
	June.	July.	Aug.	June.	July.	Aug.
1915	.. 49.4	47.1	53.8	—	2.76 ₁₀	0.19 ₁
1914	.. 48.8	50.8	50.4	0.19 ₁	—	—
1913	.. 50.2	52.9	55.0	—	0.14 ₁	0.93 ₃
1912	.. 48.9	46.9	54.1	0.04 ₁	0.01 ₁	—
1911	.. 46.8	48.9	52.0	—	0.24 ₂	—
1910	.. 45.2	49.9	56.1	0.28 ₃	—	—
1909	.. 50.3	50.1	54.6	—	0.39 ₁	1.39 ₂
1908	.. 52.8	49.0	55.0	—	0.84 ₃	0.16 ₃
1907	.. 49.9	48.9	55.6	—	—	—

REVIEW.

- (1.) *Synopsis Météorologique des Années, 1901-1913. Observations faites dans l'Observatoire Central du Prado.* Montevideo, 1914. Size 12×9 . Pp. 8. (2.) *Sinopsis Meteorológica del Año 1913.* Montevideo, 1915. Size, $11 \times 7\frac{1}{2}$. Pp. 28. (3.) *Boletín Mensual, 1914.* Montevideo, 1915. Size, $11 \times 7\frac{1}{2}$. Pp. 12.

In these three memoirs we have evidence of the increasing activity and promptitude of issue of the results of the work carried on at the Central Bureau of the National Physico-Climatological Institute of Uruguay, under the directorship of Prof. Luis Morandi.

(1.) Gives a general synopsis of the mean monthly seasonal and annual values, based on hourly observations obtained from an elaborate installation of automatic instruments. Montevideo is situated at the mouth of the River Plate, in latitude $34^{\circ} 53' S$. The mean annual temperature is $61^{\circ} 0$. The warmest months are January and February, each with a mean of $71^{\circ} 4$, and the coolest July, with a mean of $50^{\circ} 5$. The absolute maximum temperature was $102^{\circ} 7$, and the lowest $24^{\circ} 8$. The mean annual rainfall is 35.17 in., falling on 66 days, during 286 hours. The maximum daily fall recorded was 5.93 in., in May, 1906, and the greatest hourly fall 1.61 in. A map is given of the mean annual rainfall of Uruguay, deduced from 52 stations, mostly for the eight years 1906-13. This shows that the wettest part of Uruguay, with a rainfall of from 41 to 45 inches, is found over a comparatively broad strip of country contiguous to Brazil. The driest region, with a fall of from 29 to 33 inches, is located some little distance inland from the Atlantic coast. The period is too short and the data insufficient to give a true picture of Uruguay rainfall. Ample material exists which, if worked up by approved methods would yield accurate monthly and annual rainfall maps of Uruguay.

(2.) Gives an abstract of the meteorological results at the central observatory during 1913, and (3.) similar data for 1914, along with monthly and annual values of rainfall for 331 stations during the year. This latter work must have gone to press about July, so that Uruguay, along with Norway and Great Britain, publishes its rain data with remarkable promptitude. The year 1914 was, in common with the Argentine in middle latitudes, an exceptionally wet one in Uruguay, the general fall being from two and a half to three times the normal. At Montevideo 94.47 in. fell, and in some parts of the department of Colonia this amount was considerably exceeded.

It would add considerably to the interest of these memoirs if a map showing the position of the stations and orographical features could be given.

R.C.M.

RAINFALL TABLE FOR APRIL, 1916.

STATION.	COUNTY.	Lat. N.	Long. W. [°E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1916. in.
Camden Square.....	London.....	51 32	0 8	111	1'74	1'31
Tenterden.....	Kent.....	51 4	*0 41	190	1'77	1'34
Arundel (Patching).....	Sussex.....	50 51	0 27	130	1'82	'96
Fordingbridge (Oaklands)...	Hampshire.....	50 56	1 38	135	1'92	'94
Oxford (Magdalen College)...	Oxfordshire.....	51 45	1 15	186	1'67	'88
Wellingborough (Swanspool)...	Northampton.....	52 18	0 41	155	1'78	1'01
Bury St. Edmunds (Westley)...	Suffolk.....	52 15	*0 40	226	1'62	1'66
Geldeston [Beccles].....	Norfolk.....	52 27	*1 31	38	1'55	1'92
Polapit Tamar [Launceston]...	Devon.....	50 40	4 22	315	2'34	1'41
Rousdon [Lyme Regis].....	".....	50 41	3 0	516	2'39	'60
Stroud (Field Place).....	Gloucestershire..	51 44	2 13	226	2'09	'84
Church Stretton (Wolstaston)...	Shropshire.....	52 35	2 48	800	2'20	1'54
Boston.....	Lincolnshire.....	52 58	0 1	11	1'57	1'55
Worksop (Hodsock Priory)...	Nottinghamshire	53 22	1 5	56	1'62	1'11
Mickleover Manor.....	Derbyshire.....	52 54	1 32	280	1'77	1'63
Macclesfield.....	Cheshire.....	53 15	2 7	501	2'02	3'36
Southport (Hesketh Park)...	Lancashire.....	53 39	2 59	38	1'84	2'37
Arncliffe Vicarage.....	Yorkshire, W.R.	54 8	2 6	732	3'73	3'82
Goldsborough Hall.....	".....	54 0	1 25	119	1'89	1'21
Hull (Pearson Park).....	"..... E.R.	53 45	0 20	6	1'69	1'05
Newcastle (Town Moor)...	Northumberland	54 59	1 38	201	1'84	1'35
Borrowdale (Seathwaite)...	Cumberland.....	54 30	3 10	423	6'91	11'93
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	2'50	1'96
Haverfordwest.....	Pembroke.....	51 48	4 58	90	2'82	2'19
Aberystwyth (Gogerddan)...	Cardigan.....	52 26	4 1	83	2'48	3'82
Llandudno.....	Carnarvon.....	53 20	3 50	72	1'79	1'57
Cargen [Dumtries].....	Kirkcudbright...	55 2	3 37	80	2'50	3'08
Marchmont House.....	Berwick.....	55 44	2 24	498	2'28	2'68
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	2'81	4'35
Glasgow (Queen's Park)...	Renfrew.....	55 53	4 18	144	1'86	3'24
Islay (Eallabus).....	Argyll.....	55 47	6 15	68	2'64	7'20
Mull (Quinish).....	".....	56 34	6 13	35	2'98	3'45
Balquhiddy (Stronvar).....	Perth.....	56 21	4 23	422	4'15	...
Dundee (Eastern Necropolis)...	Forfar.....	56 28	2 57	199	1'93	1'42
Braemar.....	Aberdeen.....	57 0	3 24	1114	2'30	2'16
Aberdeen (Cranford).....	".....	57 8	2 7	120	2'23	2'54
Gordon Castle.....	Moray.....	57 37	3 5	107	1'74	2'72
Drumnadrochit.....	E. Inverness.....	57 20	4 29	138	1'85	2'80
Fort William.....	".....	56 49	5 6	171	3'65	5'47
Loch Torridon (Bendamph)...	W. Ross.....	57 32	5 32	20	4'70	5'93
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'02	1'95
Killarney (District Asylum)...	Kerry.....	52 4	9 31	178	3'46	6'20
Waterford (Brook Lodge)...	Waterford.....	52 15	7 7	104	2'68	2'78
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	2'54	4'07
Ennistymon House.....	Clare.....	52 57	9 18	37	2'81	4'51
Gorey (Courtown House)...	Wexford.....	52 40	6 13	80	2'37	2'00
Abbey Leix (Blandsfort)...	Queen's County..	52 56	7 17	532	2'54	2'70
Dublin (Fitz William Square)...	Dublin.....	53 21	6 14	54	2'03	1'65
Mullingar (Belvedere).....	Westmeath.....	53 29	7 22	367	2'37	3'59
Crossmolina (Enniscoe).....	Mayo.....	54 4	9 16	74	3'13	5'40
Cong (The Glebe).....	".....	53 33	9 16	112	2'98	4'28
Collooney (Markree Obsy.)...	Sligo.....	54 11	8 27	127	2'52	5'98
Seaforde.....	Down.....	54 19	5 50	180	2'76	2'83
Ballymena (Harryville).....	Antrim.....	54 52	6 13	150	2'57	4'85
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	2'50	4'62

RAINFALL TABLE FOR APRIL, 1916—*continued.*

RAINFALL OF MONTH (con.)					RAINFALL FROM JAN. 1.				Mean Annual 1875-1909.	STATION
Diff. from Av. in.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1875-1909. in.	1916. in.	Diff. from Aver. in.	% of Av.		
— 43	75	27	6	15	6·93	10·74	+3·81	155	25·11	Camden Square
— 43	76	39	6	14	7·76	10·66	+2·90	137	27·64	Tenterden
— 56	53	24	16	10	8·53	12·24	+3·71	144	30·48	Patching
— 98	49	19	16	15	9·02	10·82	+1·80	120	31·06	Fordingbridge
— 79	53	31	19	11	6·52	10·93	+4·41	168	24·58	Oxford
— 77	57	18	16	13	7·10	10·32	+3·22	145	25·20	Swanspool
+ 04	103	35	17	14	6·62	10·90	+4·28	165	25·40	Westley
+ 37	124	36	6	15	6·06	10·08	+4·02	166	23·73	Geldeston
— 93	60	34	19	13	11·62	14·27	+2·65	123	38·27	Polapit Tamar
— 179	25	30	16	10	10·13	11·15	+1·02	110	33·54	Rousdon
— 125	40	32	19	11	8·55	10·36	+1·81	121	29·81	Stroud
— 66	70	33	16	14	9·07	10·83	+1·76	119	32·41	Wolstaston
— 02	99	25	17	15	6·11	10·61	+4·50	174	23·35	Boston
— 51	69	40	19	12	6·66	9·09	+2·43	137	24·46	Hodsock Priory
— 14	92	49	17	15	7·12	12·74	+5·62	179	26·65	Mickleover
+ 134	166	59	11	15	9·48	11·47	+1·99	121	34·73	Macclesfield
+ 53	129	80	11	14	8·57	8·74	+ ·17	102	32·70	Southport
+ 09	102	95	17	18	20·04	23·44	+3·40	117	61·49	Arnccliffe
— 68	64	18	19	15	7·55	9·77	+2·22	130	27·29	Goldsbrough Hall
— 64	62	27	18	13	7·01	8·76	+1·75	125	26·42	Hull
— 49	73	27	19	15	7·47	8·77	+1·30	118	27·94	Newcastle
+ 502	173	247	17	18	41·94	50·63	+8·69	121	129·48	Seathwaite
— 54	78	33	11	16	12·11	15·05	+2·94	124	42·28	Cardiff
— 63	78	56	15	11	14·09	12·76	— 1·33	95	46·81	Haverfordwest
+ 134	154	99	16	16	12·52	14·50	+1·98	116	45·46	Gogerddan
— 22	88	31	17	12	8·54	9·69	+1·15	113	30·36	Llandudno
+ 58	123	64	23	21	13·35	16·03	+2·68	120	43·47	Cargen
+ 40	118	69	20	15	9·47	13·55	+4·08	143	33·76	Marchmont
+ 154	155	60	12	18	15·08	16·92	+1·84	112	49·77	Girvan
+ 138	174	50	24	18	10·70	14·82	+4·12	138	35·97	Glasgow
+ 456	273	80	13, 19	20	15·01	20·41	+5·40	136	48·79	Eallabus
+ 47	116	69	16	22	17·26	15·91	— 1·35	92	56·57	Quinish
...	...	...	...	...	25·24	...	...	...	73·77	Stronvar
— 51	74	21	24	15	7·91	8·74	+ ·83	110	28·64	Dundee
— 14	94	35	25	17	10·64	16·75	+6·11	158	34·93	Braemar
+ 31	114	39	16, 17	17	9·60	7·43	— 2·17	77	32·73	Aberdeen
+ 98	156	74	17	14	8·04	9·59	+1·55	119	30·34	Gordon Castle
+ 95	151	48	18	17	11·46	18·53	+7·07	161	36·13	Drumnadrochit
+ 182	150	97	16	23	26·09	33·24	+7·15	127	75·80	Fort William
+ 123	126	76	23	19	28·94	36·12	+7·18	125	83·93	Bendampf
— 07	96	32	16	14	9·99	12·76	+2·77	128	31·90	Dunrobin Castle
+ 274	179	180	25	24	18·90	19·82	+ ·92	105	54·81	Killarney
+ 10	104	57	25	18	12·28	10·97	— 1·31	89	39·57	Waterford
+ 153	160	77	24	19	12·30	14·77	+2·47	120	39·43	Castle Lough
+ 170	161	123	24	23	13·79	17·23	+3·44	125	46·52	Ennistymon
— 37	84	40	22	16	10·59	11·76	+1·17	111	34·99	Courtown Ho.
+ 16	106	37	19	20	10·83	11·33	+ ·50	105	35·92	Abbey Leix
— 38	81	35	19	18	8·08	10·01	+1·93	124	27·68	Dublin
+ 122	152	65	15	21	10·78	14·16	+3·38	131	36·15	Mullingar
+ 227	173	93	24	20	17·04	21·53	+4·49	126	52·87	Enniscooe
+ 130	144	99	24	22	15·29	17·91	+2·62	117	48·90	Cong
+ 346	238	80	24	23	12·92	16·26	+3·34	126	42·71	Markree
+ 07	103	37	13	15	11·82	11·02	— ·80	93	38·91	Seaforde
+ 228	189	94	24	20	12·36	14·56	+2·20	118	40·84	Ballymena
+ 212	185	83	24	18	11·62	13·95	+2·33	120	39·38	Omagh

SUPPLEMENTARY RAINFALL, APRIL, 1916.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road .	1·72	XI.	Lligwy	1·66
„	Ramsgate	1·58	„	Douglas	3·39
„	Hailsham	1·56	XII.	Stoneykirk, Ardwell House...	3·40
„	Totland Bay, Aston House...	·45	„	Carsphairn Shiel	7·66
„	Stockbridge, Ashley..	·49	„	Beattock, Kinnelhead	5·15
„	Grayshott	·96	„	Langholm, Drove Road	4·16
III.	Harrow Weald, Hill House...	1·35	XIII.	Selkirk, The Hangingshaw..	3·06
„	Pitsford, Sedgebrook....	1·05	„	North Berwick Reservoir....	1·56
„	Woburn, Milton Bryant.....	1·14	„	Edinburgh, Royal Observaty.	2·43
„	Chatteris, The Priory.....	·87	XIV.	Maybole, Knockdon Farm ...	3·96
IV.	Elsenham, Gaunts End	1·38	XV.	Buchlyvie, The Manse	3·44
„	Shoeburyness	1·07	„	Ballachulish House	5·89
„	Colchester, Hill Ho., Lexden	1·45	„	Oban	4·20
„	Ipswich, Rookwood, Copdock	1·36	„	Campbeltown, Witchburn ..	3·41
„	Aylsham, Rippon Hall	2·07	„	Holy Loch, Ardnadam.....	7·59
„	Swaffham	1·86	„	Tiree, Cornaigmore	2·96
V.	Bishops Cannings	·82	XVI.	Dollar Academy	...
„	Wimborne, St. John's Hill...	·90	„	Glenlyon, Meggernie Castle..	5·14
„	Ashburton, Druid House..	1·36	„	Blair Atholl	1·76
„	Cullompton	1·43	„	Coupar Angus	1·46
„	Lynmouth, Rock House	1·58	„	Montrose, Sunnyside Asylum.	1·67
„	Okehampton, Oaklands.....	1·63	XVII.	Alford, Lynturk Manse	3·85
„	Hartland Abbey	·93	„	Fyvie Castle	3·49
„	Probus, Lamellyn.....	·72	„	Keith Station ..	2·05
„	North Cadbury Rectory.....	1·27	XVIII.	Rothiemurchus	3·14
VI.	Clifton, Stoke Bishop	1·13	„	Loch Quoich, Loan	14·90
„	Ledbury Underdown.....	1·05	„	Skye, Dunvegan	5·33
„	Shifnal, Hatton Grange.....	1·53	„	Lochmaddy, Bayhead	2·41
„	Droitwich	·99	„	Fortrose	1·57
„	Blockley, Upton Wold.....	1·32	„	Glencarron Lodge	6·13
VII.	Market Overton.....	...	XIX.	Altnaharra	2·63
„	Market Rasen	1·38	„	Melvich	2·33
„	Bawtry, Hesley Hall	1·29	„	Loch More, Achfary	4·98
„	Derby, Midland Railway.....	1·62	XX.	Dunmanway, The Rectory ..	5·33
„	Buxton	4·87	„	Glanmire, Lota Lodge.....	3·19
VIII.	Nantwich, Dorfold Hall	1·85	„	Mitchelstown Castle.....	3·31
„	Chatburn, Middlewood	3·17	„	Darrynane Abbey.....	...
„	Lancaster, Strathspey	2·65	„	Clonmel, Bruce Villa	2·42
IX.	Langsett Moor, Up. Midhope	2·19	„	Newmarket-on-Fergus,Fenloe	...
„	Scarborough, Scalby	1·39	XXI.	Enniscorthy, Ballyhyland...	2·41
„	Ingleby Greenhow	1·71	„	Rothnen, Clonmannon	1·28
„	Mickleton	2·60	„	Ballycumber, Moorock Lodge	3·24
X.	Bellingham, High Green Manor	4·52	„	Balbriggan, Ardgillan	1·38
„	Ilderton, Lilburn Cottage ...	1·82	„	Castle Forbes Gardens.....	3·82
„	Thirlmere, The Bank	5·08	XXII.	Ballynahinch Castle.....	5·61
XI.	Llanfrechfa Grange	1·39	„	Woodlawn	4·08
„	Treherbert, Tyn-y-waun	5·64	„	Westport, St. Helens ..	4·94
„	Carmarthen, The Friary	3·19	„	Dugort, Slievemore Hotel ...	6·67
„	Fishguard, Goodwick Station.	2·59	XXIII.	Enniskillen, Portora.....	5·35
„	Crickhowell, Tal-y-maes	3·00	„	Dartrey [Cootehill]	4·27
„	New Radnor, Ednol	2·17	„	Warrenpoint, Manor House ..	2·68
„	Birmingham WW., Tyrmynydd	5·48	„	Belfast, Cave Hill Road	4·13
„	Lake Vyrnwy	4·22	„	Glenarme Castle.....	5·98
„	Llangynhafal, Plâs Drâw.....	1·72	„	Londonderry, Creggan Res...	5·55
„	Dolgelly, Bryntirion.....	7·35	„	Dunfanaghy, Horn Head ...	4·56
„	Bettws-y-Coed, Tyn-y-bryn...	4·49	„	Killybegs	9·41

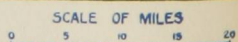
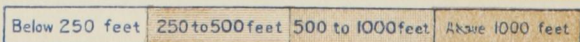
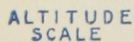
THAMES VALLEY RAINFALL.—APRIL, 1916.



Symons's Meteorological Magazine.

Watershed of River Thames above Teddington, and River Lee above Feltham Weir.

Rainfall Stations reporting



THE WEATHER OF APRIL.

DURING the first three days of the month an anticyclone lay over the British Islands and some rather high temperatures, for the time of the year, were recorded. On the 1st, shade maxima exceeding 60° were registered at several widely separated places, including Ireland, the highest reported being 65° at Aberdeen. Still higher values occurred on the 3rd when the temperature rose to 71° at Tunbridge Wells and Westminster, and to 70° at Norwich. Sharp frost was experienced in most localities, the shade minimum on the 2nd falling to 21° at Eskdalemuir and 24° at Aspatria. From the 4th until about the 24th very changeable weather was experienced. Temperature during this period was periodically below the normal nearly everywhere, but with a good deal of bright sunshine. After the 15th, low pressure areas in the North Sea produced a rainy type of weather accompanied by cold northerly and easterly winds. Low night temperatures were noted on the 6th, 10th and 15th in Scotland, and on the 9th, 10th and 14th in England and Ireland, while as late as the 23rd or 24th shade minima under 32° occurred in Scotland, the Midland counties and the north of Ireland. The last week of the month was very warm, and little rain fell. On the 27th the shade temperature at Camden Square rose to 77° , and on the 29th Cambridge and Raunds reported 76° . The mean temperature of the whole month was slightly above the normal over the greater part of England and in Scotland, and just the average in the north-west of England, the Channel Islands and the south of Ireland. Cool weather prevailed over the north of Ireland where the mean was a degree below the average.

The duration of bright sunshine varied considerably. Over England there was a general daily excess as compared with the normal of three-quarters of an hour, rising to one and a half in the south-west and in the Channel Islands. In Scotland and Ireland a small deficiency occurred.

The durations at individual stations were as follows:—Camden Square, 181 hours; Totland Bay, 231 hours; Weymouth, 228 hours; Sidmouth, 224 hours; Ilfracombe, 205 hours; Bath, 182 hours; Haverfordwest, 221 hours; Copdock, 207 hours; Southport, 192 hours; Hodsock Priory, 162 hours; Perth, 156 hours; Swinton, 146 hours; Paisley, 140 hours; Bolton, 129 hours; Hull, 115 hours; Loch Stack, 108 hours.

The distribution of rainfall compared with the normal showed in general a deficiency over the southern half of England, most pronounced in the Devon-Cornwall peninsula where many stations had only a quarter of the average, and an excess elsewhere. The greatest rainfall, ten inches or more, fell in the normally rainy areas in Kerry, Carmarthen and West Inverness, and the least, about half-an-inch, on the south coast from the Isle of Wight to Torquay. Heavy daily falls were uncommon, the greatest being 2.47 in. at Seathwaite on the 17th. Heavy local thunderstorm rain in East Yorkshire on the 20th yielded quantities slightly under two inches, and in the south-east of Ireland on the 24th and 25th falls of about the same amount were recorded during the passage of a shallow depression secondary to that of the main disturbance in the north-west.

In the Thames Valley the distribution of rainfall was remarkably uniform. A little more than an inch and a half fell along the North Downs and that part of Suffolk on the Thames Valley map. Less than an inch fell to the north of the Thames estuary and over a large portion of the south-western areas.

The general rainfall expressed as a percentage of the average was:—England and Wales, 93 per cent.; Scotland, 138 per cent.; Ireland, 149 per cent.; British Isles, 121 per cent. In London (Camden Square) the mean temperature was $49^{\circ} \cdot 2$ or $1^{\circ} \cdot 1$ above the average. Duration of rainfall, 29.6 hours. Evaporation, 1.61 in.

Climatological Table for the British Empire, November, 1915.

STATIONS. (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain		Aver. Cloud.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
								0-100			inches		
London, Camden Square	56°6	12	25°6	27	45°3	33°7	35°3	86	83°8	23°3	2·31	9	5·6
Malta	77·5	9	50·0	18c	68·6	59·1	...	80	126·0	...	7·61	4	1·0
Lagos	90·0	15	71·0	17	87·6	76·0	75·2	79	157·0	68·0	4·81	12	6·3
Cape Town	93·6	20	44·8	14	74·4	56·4	54·3	67	...	...	1·20	6	4·8
Johannesburg	87·7	8	42·2	1	73·7	53·6	50·3	69	...	40·0	5·88	12	4·9
Mauritius	87·6	20a	59·2	13	83·4	67·5	62·8	67	...	52·6	·64	14	5·3
Bloemfontein .	90·8	29	47·0	13	79·6	53·5	49·5	53	..	...	1·86	7	3·2
Calcutta... ..	90·6	1	60·2	28	84·6	70·4	69·0	77	...	50·3	2·33	4	4·1
Bombay... ..	91·7	11	72·1	6	88·1	75·9	72·5	74	139·0	53·7	·02	2	2·3
Madras	92·7	1	71·4	5, 14	86·0	74·1	73·0	85	156·4	68·1	20·79	18	5·9
Colombo, Ceylon	88·7	30	71·2	18	84·0	73·8	73·1	85	157·6	68·3	25·14	22	7·6
Hongkong	86·1	4	57·6	29	75·5	66·8	61·5	70	...	...	1·89	13	7·2
Sydney	97·1	14	48·3	24	78·8	58·4	48·5	42	146·5	38·3	·07	5	3·2
Melbourne	92·0	4, 9	40·7	23	70·9	50·0	44·5	52	146·5	33·0	·51	11	5·6
Adelaide	93·9	17	44·3	16	74·5	52·8	46·3	50	147·9	36·4	·33	5	4·4
Perth	94·0	28	51·4	18	78·7	59·6	53·1	56	166·6	42·0	·34	6	3·1
Coolgardie	104·4	7	50·6	5	89·0	56·8	45·9	33	158·6	...	·03	1	4·6
Hobart, Tasmania	80·8	17	39·0	29	62·0	46·2	40·2	55	143·8	33·1	2·55	22	6·4
Wellington	66·6	4	42·0	10	61·9	51·6	48·5	74	138·8	33·8	5·50	16	7·3
Auckland	72·5	16b	45·0	10	65·9	54·0	53·0	81	146·0	45·0	5·32	23	6·8
Jamaica, Kingston	88·7	23	68·5	9	85·5	71·3	71·2	77	...	...	2·37	11	...
Grenada	88·0	1	70·0	14	85·0	74·0	...	81	136·0	...	9·10	18	3·6
Toronto	61·3	1	23·7	17	46·5	34·8	33·0	81	112·4	20·0	1·89	12	6·4
Fredericton	57·5	2	17·0	19d	41·7	29·7	31·0	84	...	...	3·02	...	6·7
St. John, N.B.	52·2	2	23·5	19	42·7	33·3	32·2	76	...	21·5	4·20	10	7·3
Alberta, Edmonton	52·7	4	4·8	12	34·8	15·4	...	73	99·0	—8·8	·74	6	5·2
Victoria, B.C. ...	53·7	3	33·2	26	47·4	39·2	40·0	87	110·5	25·6	4·57	26	7·4
	a and 28.		b and 29.		c and 28.		d and 24.						

a and 28. b and 29. c and 28. d and 24.

MALTA.—An exceptionally severe TS on the 22nd, with a wind velocity of 28 or 29 miles per hour, and a heavy R.

Johannesburg.—Bright sunshine, 258·9 hours.

Mauritius.—Mean temp. 0°·2 below, dew point 1·4 below, and R 1·10 in. below, averages.

COLOMBO, CEYLON.—Mean temp. 79°·0, or 0°·6 below, dew point same as average, and R 13·12 in. above, averages. TSS on 5 days.

HONGKONG.—Mean temp. 70°·9, mean hourly velocity of wind 12·0 miles. Bright sunshine 154·4 hours.

Melbourne.—Mean temp. 0°·9 below and R 1·68 in. below, averages.

Adelaide.—Mean temp. 3°·5 below and R ·83 in. below, averages.

Coolgardie.—Temp. 1°·9 above and R below, averages.

Hobart.—Mean temp. 4°·4 below and R ·05 in. above, averages. Exceptionally squally month.

Wellington.—Mean temp. 1°·3 above and R 2·12 in. above, averages. Bright sunshine 200·2 hours; T and L on the 6th.

Auckland.—Unusually windy. R above and mean temp. below, averages.

ALBERTA, EDMONTON.—Dry, sunny and warm. S on 10 days. Fog on 4 days.